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# UTILITY PATENT APPLICATION TRANSMITTAL (Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.

233

Total Pages in this Submission

**TO THE ASSISTANT COMMISSIONER FOR PATENTS**

Box Patent Application

Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

**SCREENING HOUSING FOR MICROWAVE CIRCUITS**

and invented by:

**Wolfgang KUSCHKE, Hardial SINGH GILL, Willibald KONRATH**

If a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: \_\_\_\_\_

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: \_\_\_\_\_

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: \_\_\_\_\_

Enclosed are:

**Application Elements**

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 12 pages and including the following:
  - a. ☒ Descriptive Title of the Invention
  - b. ☐ Cross References to Related Applications (if applicable)
  - c. ☐ Statement Regarding Federally-sponsored Research/Development (if applicable)
  - d. ☐ Reference to Microfiche Appendix (if applicable)
  - e. ☒ Background of the Invention
  - f. ☒ Brief Summary of the Invention
  - g. ☒ Brief Description of the Drawings (if drawings filed)
  - h. ☒ Detailed Description
  - i. ☒ Claim(s) as Classified Below
  - j. ☒ Abstract of the Disclosure

Express Mail Mailing Label

Number EH 701277562 USDate of Deposit June 10, 1998

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

**UTILITY PATENT APPLICATION TRANSMITTAL**  
**(Large Entity)**

*(Only for new nonprovisional applications under 37 CFR 1.53(b))*

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233

Total Pages in this Submission

**Application Elements (Continued)**

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*
- a. ☒ Formal                      Number of Sheets 1
- b. ☐ Informal                      Number of Sheets \_\_\_\_\_
4. ☒ Oath or Declaration
- a. ☒ Newly executed *(original or copy)*      ☐ Unexecuted
- b. ☐ Copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional application only)*
- c. ☒ With Power of Attorney      ☐ Without Power of Attorney
- d. ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting inventor(s) named in the prior application,  
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*  
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied  
under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby  
incorporated by reference therein.
6. ☐ Computer Program in Microfiche *(Appendix)*
7. ☐ Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all must be included)*
- a. ☐ Paper Copy
- b. ☐ Computer Readable Copy *(identical to computer copy)*
- c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

**Accompanying Application Parts**

8. ☒ Assignment Papers *(cover sheet & document(s))*
9. ☐ 37 CFR 3.73(B) Statement *(when there is an assignee)*
10. ☐ English Translation Document *(if applicable)*
11. ☒ Information Disclosure Statement/PTO-1449      ☒ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Acknowledgment postcard
14. ☒ Certificate of Mailing
- ☐ First Class      ☒ Express Mail *(Specify Label No.):* EH 701277562 US

**UTILITY PATENT APPLICATION TRANSMITTAL**  
**(Large Entity)**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

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**Accompanying Application Parts (Continued)**

15. ☒ Certified Copy of Priority Document(s) (if foreign priority is claimed)

16. ☐ Additional Enclosures (please identify below):

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**Fee Calculation and Transmittal**

**CLAIMS AS FILED**

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	7	- 20 =	0	x \$22.00	\$0.00
Indep. Claims	2	- 3 =	0	x \$82.00	\$0.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
BASIC FEE					\$790.00
OTHER FEE (specify purpose) RECORDATION FORM					\$40.00
TOTAL FILING FEE					\$830.00

- ☒ A check in the amount of \$830.00 to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. 19-4675 as described below. A duplicate copy of this sheet is enclosed.
- ☐ Charge the amount of as filing fee.
- ☒ Credit any overpayment.
- ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

  
Signature

Dated: JUNE 10, 1998

cc:

R. 1000  
T. 1000

BE IT KNOWN that We, *Wolfgang KUSCHKE, Hardial Singh GILL*, and *Willibald Konrath*, citizens of Germany, whose post office addresses are, respectively, Im Rank 1, 71570 Oppenweiler, Germany; Elly-Heuss-Knapp-Weg 38/3, 71522 Backnang, Britisch, Eichendorffweg 17, 71554 Weissach, Germany

#### *SCREENING HOUSING FOR MICROWAVE CIRCUITS*

of which the following is a complete specification:

## BACKGROUND OF THE INVENTION

The present invention relates to a screening housing for microwave circuits. More particularly, it relates to such a screening housing with a plurality of chambers which are screened from one another and which accommodate circuit units to be oppositely electromagnetically coupled.

Conventionally, a multi-chamber housing which must accommodate a plurality of microwave circuits screened from one another in a high frequency type manner is produced by milling of the individual chambers from a massive metal body. One of such screening housings is disclosed for example in the German document DE 35 04 726 C1. The manufacture of such a housing with several high frequency-tight chambers is very expensive.

Another German patent document DE 43 19 965 A1 discloses a housing with separating joints provided for example between the cover and the housing walls, and sealing profiles inserted in the separating joints and composed of an elastic polymer with embedded metal particles.

## SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a screening housing of the above mentioned type which avoids the disadvantages of the prior art.

5 More particularly, it is an object of the present invention to provide a screening housing of the above mentioned general type which can be produced with lower expenses.

10 In keeping with these objects and with others which will become apparent hereinafter, one feature of present invention resides, briefly stated in a screening housing for microwave circuits, in which on the inner side of the cover which closes the housing, a substrate is arranged of a polymer with embedded metal particles, and webs are provided on the substrate which together with the placed cover form the separating walls between the chambers.

15 The substrate with the webs which form the chambers can be cast on the inner side of the cover. Any structure of the substrate with webs can be made without high expenses. The substrate from a polymer with the

embedded metal particles not only performs a screening function, but also dampens simultaneously undesirable resonance frequency in the chambers.

The material of the housing, in particular polymer with the embedded metal particles can be a silicone mass filled with iron powder.

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The novel features which are considered as characteristic for the present invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings.

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## BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a view showing an open screening housing with its interior, in accordance with the present invention; and

Figure 2 is a view showing the same screening housing from an inner side of its cover.

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## DESCRIPTION OF PREFERRED EMBODIMENTS

A screening housing for microwave circuits in accordance with the present invention is identified as a whole with reference numeral 1. The screening housing has a single large chamber 2 which can be produced for example by milling from a metal block. The chamber 2 serves for receiving of microwave circuits which must be screened electromagnetically from outside. The housing 1 is closed with a cover 3.

The separating joints between the housing walls and the cover must be sealed so that no electromagnetic energy can escape outwardly. Several subunits which must be screened magnetically from one another are usually located in such a screening housing. For this purpose, several chambers for receiving individual circuit unit which must be screened electromagnetically from one another are provided in the interior of the housing 1.

Figure 2 shows how the chambers are formed in the screening housing 1, and a perspective view of the inner side of the housing cover 3 is illustrated. A substrate 4 composed of a polymer with embedded metal particles is arranged on the inner side of the cover 3. The substrate 4 for example is composed of a silicone mass which is filled with iron powder.

Several webs 5, 6, 7, 8 are provided on the face of the substrate 4 which faces toward the interior of the housing 1. When the cover 3 is placed on the housing, the separating walls 5, 6, 7, 8 together with the cover 3 form the individual chambers inside the screening housing. As shown in the embodiment of Figure 2, the webs 5, 6, 7, 8 can have an arbitrarily complicated structure.

The substrate 4 with the webs 5, 6, 7, 8 can be manufactured in a simple manner by casting with a mold on the inner side of the cover 3. The webs 5, 6, 7, 8 abut in a form-locking manner against the bottom of the chamber 2 when the cover 3 is placed on the housing. Additionally, they can be provided with throughgoing openings 9, 10, 11 for connecting conductors between the individual circuit units.

The webs 5, 6, 7, 8 which are composed of polymer with embedded metal particles have not only the function of screening walls but also dampen simultaneously the undesired resonance frequencies in the chamber.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of constructions differing from the types described above.

While the invention has been illustrated and described as embodied in screening housing for microwave circuits, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims.

## CLAIMS

1                    1. A screening housing for microwave circuits, comprising a  
2                    housing body having an interior and open at least at one side; a cover  
3                    closing said interior of said housing; and means forming a plurality of  
4                    chambers provided for accommodating of individual circuit units and  
5                    screened from one another, said means including a substrate and applied  
6                    on an inner side of said cover and a plurality of webs which are formed on  
7                    said substrate so that when said cover closes said housing said webs form  
8                    separating walls between said chambers.

1                    2. A screening housing as defined in claim 1, wherein said  
2                    housing body is composed of an electromagnetic energy screening material.

1                    3. A screening housing as defined in claim 1, wherein said  
2                    substrate is composed of a polymer with embedded metal particles.

1                                4. A screening housing as defined in claim 3, wherein said  
2                                substrate is composed of a silicone mass with embedded metal powder.

1                                5. A screening housing as defined in claim 1, wherein said  
2                                substrate and said webs are formed of one piece with one another.

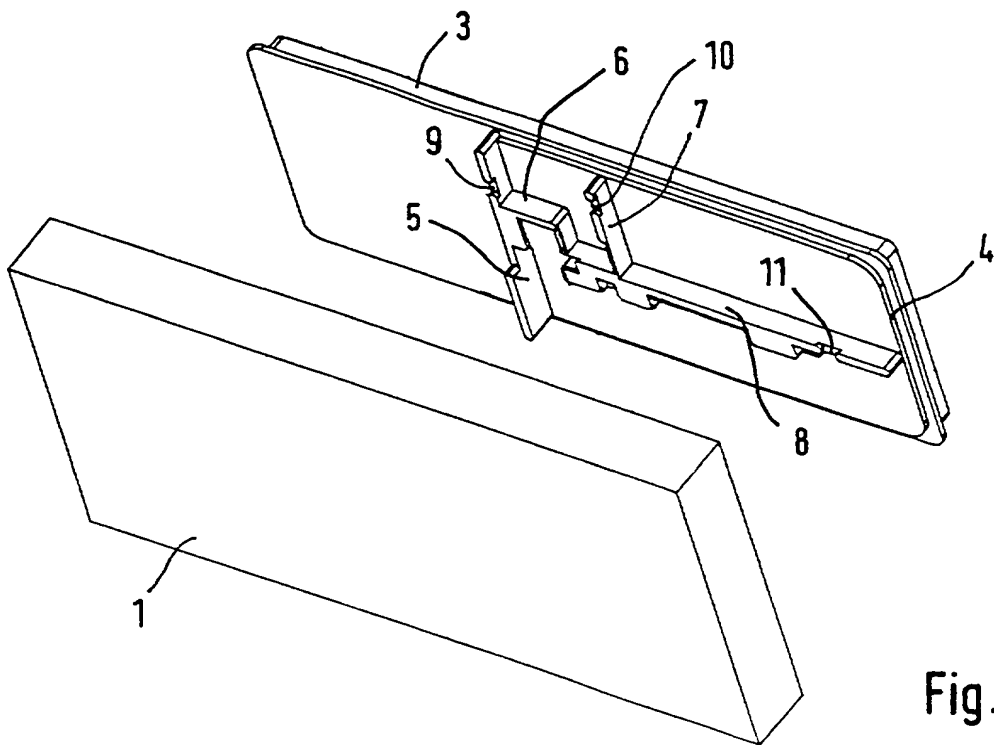
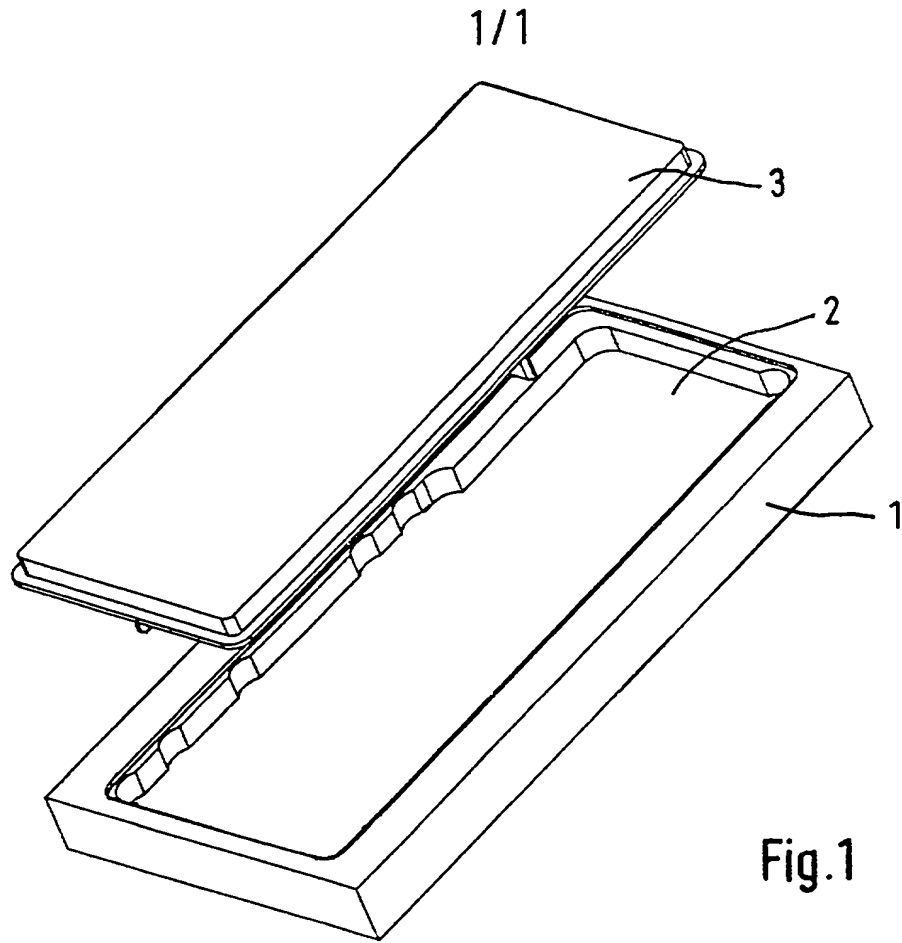
1                                6. A screening housing as defined in claim 5, wherein said  
2                                substrate and said webs are composed of the same material.

7. A screening housing for microwave circuits, comprising a  
housing body having an interior and open at least at one side; a cover  
closing said interior of said housing; and means forming a plurality of  
chambers provided for accommodating of individual circuit units and  
screened from one another, said means including a composed of a polymer  
with embedded metal particles and applied on an inner side of said cover

and a plurality of webs which are formed on said substrates so that when said cover closes said housing said webs form separating walls between said chambers.

## ABSTRACT OF THE DISCLOSURE

A screening housing for microwave circuits has a housing body having an interior and open at least at one side, a cover closing the interior of the housing, and means forming a plurality of chambers provided for accommodating of individual circuit units and screened from one another, the means including a substrate and applied on an inner side of the cover and a plurality of webs which are formed on the substrates so that when the cover closes the housing the webs form separating walls between the chambers.



COMBINED DECLARATION AND  
POWER OF ATTORNEY

ATTORNEY DOCKET NO. 233

As a below-named inventor, I hereby declare that:

Wolfgang KUSCHKE  
Hardial SINGH GILL  
Willibald KONRATH

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention SCREENING HOUSING FOR MICROWAVE CIRCUITS the specification of which:

(Check one) X is attached hereto.

\_\_\_ was filed on \_\_\_\_\_ as

Application Serial No. \_\_\_\_\_ and

was amended on \_\_\_\_\_  
(if applicable)

was amended through \_\_\_\_\_  
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section § 119, of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):

Priority Claimed

<u>1 97 28 839.1-34</u>	<u>DE</u>	<u>JULY 5, 1997</u>	<u>X</u>	___
Priority Number	Country	Date filed (Priority Date)	Yes	No
___	___	___	___	___
Priority Number	Country	Date filed (Priority Date)	Yes	No
___	___	___	___	___
Priority Number	Country	Date filed (Priority Date)	Yes	No

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title

35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 35, Code of Federal Regulations, Section 1.56(a), which occurred between the filing date of the prior application and the national or PCT International filing date of this application:

_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status - Patented, pending, abandoned)
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_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status - Patented, pending, abandoned)
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_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status - Patented, pending, abandoned)
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that those statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

The undersigned hereby authorizes **Michael J. Striker** and the firm of **Striker, Striker & Stenby**, to accept and follow instructions from:

**ROBERT BOSCH GMBH**

as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between Michael J. Striker, the firm of Striker, Striker & Stenby, and the undersigned. In the event of a change in the persons from whom instructions may be taken, Michael J. Striker and the firm of Striker, Striker & Stenby will be so notified by the undersigned.

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

POWER OF ATTORNEY: Michael J. Striker, Registration No. 27233

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360 Lexington Avenue  
New York, New York 10017  
U.S.A.

Signature: <i>X Wolfgang Kuschke</i>	Date: <i>7.5.98</i>	Residence and Full Postal Address: Im Rank 1 71570 Oppenweiler Germany
Full Name of First or Sole Inventor: Wolfgang KUSCHKE	Citizenship: DE	
Signature: <i>X Hardial Singh Gill</i>	Date: <i>7.5.98</i>	Residence and Full Postal Address: Elly-Heuss-Knapp-Weg 38/3 71522 Backnang Germany
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Full Name of Third Inventor: Willibald KONRATH	Citizenship: DE	
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Full Name of Fifth Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Sixth Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Seventh Inventor:	Citizenship:	
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Full Name of Eighth Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Ninth Inventor:	Citizenship:	

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